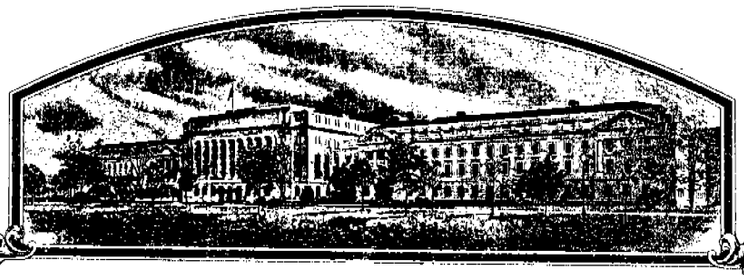

No. 7800002

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Douglass W. King Company

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *seventeen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'DK-22S'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 13th *day of* September *in the year of our Lord one thousand nine hundred and* seventy-nine

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

Application 7800002

FORM GR-470 (1-76)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
PLANT VARIETY PROTECTION OFFICE
NATIONAL AGRICULTURAL LIBRARY
BELTSVILLE, MARYLAND 20705

FORM APPROVED OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
Exp. No. 72SA122	DK-22S	PV NUMBER 7800002
2. KIND NAME	3. GENUS AND SPECIES NAME	FILING DATE 10-12-77 / TIME 3:00 A.M. (P.M.)
Common Wheat	Triticum aestivum L.	FEE RECEIVED $250.00 / $250.00 / $250.00 — DATE 10-12-77 / 10-12-77 / 8-8-79
4. FAMILY NAME (BOTANICAL)	5. DATE OF DETERMINATION	
Gramineae	May 1975	

6. NAME OF APPLICANT(S)	7. ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)	8. TELEPHONE AREA CODE AND NUMBER
Douglass W. King [redacted] Company	4627 Emil Road, P.O. Box 20320 San Antonio, Texas 78286	512/661-4191

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (*Corporation, partnership, association, etc.*)	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Texas	Mar.1, 1946

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

Mr. Blake Williams, Jr., President
Douglass W. King Co., P.O. Box 20320, San Antonio, Texas 78286

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [X] YES [ ] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations? [X] YES [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed? ONE (1) YEAR EACH [X] FOUNDATION [X] REGISTERED [X] CERTIFIED

15. Does the applicant(s) agree to the publication of his/her (their) name(s) and address in the Official Journal? [X] YES [ ] NO

16. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

Jan 18, 1978 (DATE) — Blake Williams, Jr. (SIGNATURE OF APPLICANT)

(DATE) — (SIGNATURE OF APPLICANT)

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, National Agricultural Library, Beltsville, Maryland 20705. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

FEB 13 1978

ITEM

5 Give the date the applicant determined that he had a new variety based on (1) the definition in Section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a Give (1), the genealogy, including public and commerical varieties, lines, or clones used, and the breeding method. (2), the details of subsequent stages of selection and multiplication. (3), the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4), evidence of stability.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties; (1) identify these varieties and state all differences objectively; (2) Attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form for all characteristics, for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe; such as; plant habit, plant color, disease resistance, etc.

14A If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled or published or the certificate has been issued. However, if the applicant specifies "NO", he may change his choice. (See Section 180.15 of the Regulations and Rules of Practice.)

ITEM 13A EXHIBIT A

Origin and History of DR-22S Hard Red Spring Wheat

Class : Hard red spring, bread wheat, Triticum aestivum L.

Name: Variety Dk-22S. Owned by Douglass W. King Seed Company. The name has been cleared and approved by the Trademark Division, U.S. Department of Agriculture. (See letter).

Developed by I.M. Atkins, Breeder and Consultant and Louis Jupe, Agronomist, for Douglass W. King Seed Company.

Plant Protection Certificate: (Number to be assigned).

Breeding and increase procedures:
Parentage is unknown. In the fall of 1969, approximately 1000 wheat hybrids, remnant F_2 seed, were received from the CIMMYT group in Mexico City.

F_3 hybrid rows were grown in 1969-70 season at San Antonio, Texas. Severe thinning of stands owing to low temperatures and drouth provided desirable natural selection. Remaining plants were harvested in bulk. In 1971, a large bulk population and some plant rows were seeded. Head and plant selections were sent to Aberdeen, Idaho the next summer. Bulk F_5 amd increased F_6, plus bulk populations were grown in 1972. Some lines again were sent north for a summer crop.

1973 Bulk populations and plant rows grown. Superior lines grown in summer increase at Aberdeen, Idaho.
1974 Continued selection and testing of superior lines. Single and 4-row tests for yield and adaptation.
1975 Replicated and preliminary trials of many strains. DK-22S and others tested at several locations.
1976 Replicated and preliminary trials at several locations. Purification and summer increase of promising lines at Aberdeen, Idaho.
1977 Continue replicated tests, quality tests and disease tests of superior lines. Increase DK-22S and other lines. Purification of foundation seed.
1978 Planned further increase and purification of foundation seed in preparation for distribution on small scale.

Stability: DK-22S has shown excellent uniformity and stability of plant type under several conditions from both winter and spring seeding. Off-types which do occur and are being taken out include brown-chaffed plants, those slightly taller and later maturing than DK-22S and occassional awnless plants from natural crossing. Off-type plants should not exceed one plant in 2000 of foundation seed fields and not more than one in 1000 in certified fields.

Semi-dwarf varieties are frequently more variable in height than standard height varieties and more subject to natural crossing. Off-type plants are more easily visable in such.

Aug. 30,1978

ITEM 13 B NOVELTY STATEMENT (Revised)

For

DK-22S Hard Red Spring Wheat

DK-22S hard red spring wheat differs from Cajeme 71, the dominant commercial variety of the growing area, in having statistically significant shorter mature leaves (19.01 vs 20.65 mm. for Cajeme 71); shorter spikes (62.9 vs 77.0 mm. for Cajeme 71); much shorter beaks (4.71 vs 14.4 mm. for Cajeme 71), and shorter awns (44.5 vs 59.9 for Cajeme 71). The glumes were shorter and more narrow, but although significant, these differences were small.

The plants of DK-22S are ~~about the same height as~~ slightly taller than Cajeme 71 (23.8 inches vs 23.0 for Cajeme 71), both being about 12 cm. shorter than Penjamo 62. These major differences listed above differentiate DK-22S from Cajeme 71 and other commercial varieties tested or observed. Other differences may be observed under some conditions. Cajeme 71 is the variety most similar to DK-22S.

B 10/19/78

Grain yields of DK-22S have been superior to Cajeme 71 (29.9 bushels vs 27.0 for Cajeme 71) and other commercial varieties. Test weight of DK-22S averaged 58.4 vs 56.1 pounds per bushel for Cajeme 71, a significant difference. Seed length averaged 6.09mm. vs 7.03 mm. for Cajeme 71 and the seed weight per 100 kernels was 3.0 grams compared to 3.25 grams for Cajeme 71. Dk-22S has been highly resistant to leaf rust whereas Cajeme 71 showed 38 percent rust in the same tests. Milling and baking tests show DK-22S is superior to Cajeme 71 and Penjamo 62 for the production of baker flour.

Reviewed by J. M. Atkin

Table of means, differences and Statistical Data For Characters of DK-225 and Cajeme 71 Wheats

Douglass W. King Seed Co.

Character	DK-225	Cajeme 71	Difference 225 vs Cajeme 71	T Value	Significant at .05 level	Significant at .01 level
Seedling leaf width, mm	6.511	5.850	0.660			
Inch	0.256	0.230	0.026	0.025 NS	2.01	2.68
Mature leaf length, Cm.	19.01	20.65	- 1.64	3.369**	2.01	2.68
Inch	7.48	8.13	- 0.65			
Mature leaf width, mm	10.586	10.081	- 0.505			
Inch	0.417	0.397	0.020	0.390 NS	2.01	2.68
Spike length, cm.	6.30	7.70	- 1.40			
Inch.	2.48	3.03	- 0.55	12.861**	2.01	2.68
Spike width, mm.	10.02	10.08	- 0.06			
Inch	0.394	0.397	- 0.003	0.246 NS	2.01	2.68
Glume length, mm.	7.97 10/18/78	9.97	- 2.26			
Inch	0.314 10/18/78	0.393	- 0.079	16.603*	2.01	2.68
Glume width, mm.	3.52	3.90	- 0.38			
Inch.	0.139	0.154	- 0.015	3.153**	2.01	2.68
Awn length, mm.	44.51	59.90	- 15.38 10/18/78 as per letter		10/13/78	
Inch	1.753	2.358	- 0.606	7.537**	2.01	2.68
Beak length, mm.	4.714	14.430	- 9.716			
Inch.	0.186	0.568	- 0.382	17.580**	2.01	2.68
Internode length, cm	11.18	11.68	- 0.50			
Inch	4.40	4.60	- 0.20	1.474 NS	2.01	2.68
Grain yield, bu/A	29.9	27.0	2.9	0175 NS	2.31	3.36
Test weight, lbs/bu.	58.4	56.2	2.2	3.789**	2.36	3.50
Leaf rust, o/o 4 Sta/Yr.	38	T-	38			
Heading from Jan. 18 seeding, 1975	Apr 7	Apr. 7	0			
Seed length, mm	6.09	7.03	- 0.94			
Seed width, mm	2.97	2.86	0.11			
Seed weight @ 100 seed	3.00	3.25	-0.25			
Plant height, cm	59.2	58.4	0.80			
Inch.	23.3	23.0	0.30			

** Significant at .01 level * at .05 level.

Statistical analysis of last items not possible, field observations or measurements made in large units

Summary by J. M. Atkin

6

ITEM 13 D Exhibit D (continued, page 2) revised.

1. Kind: Common hard red spring wheat, variety DK-22S

2. Type: DK-22S spring wheat is a day-length insensitive hard, red spring wheat. Owing to the mild climate of South Texas, this type of wheat can be grown from mid-winter seeding (Dec. 15 to Feb. 10) and will mature in May. This type may also be spring seeded at the higher elevations of the High Plains of Texas (Feb. 15 to Mar. 15) where it matures in late June.

3. Season: The number of days from mid-winter seeding to first flowering may range from 60 to 80 days (mean 66 days) in South Texas but may range from 90 to 100 days in West Texas.

4. Maturity: Variety DK-22S is usually about the same in maturity as the commercial variety Cajeme 71 but may be a day earlier under some conditions.

5. Plant height: Plants of DK-22S average approximately the same in height as Cajeme 71 (59.2 vs 58.4 cm. for Cajeme) and both are 10 to 14 cm. shorter than Penjamo 62.

6,7,8,9. See chart.

10. Leaf: The mature leaves of DK-22S averaged 1.64 cm. shorter than Cajeme 71 (19.01 vs 20.65 cm.), small be significant difference. The width of both the seedling and mature leaves were the same as Cajeme 71, with limits of error.

11. Head or spike: The spikes of DK-22S averaged 1.40 centimeters (0.55 inch) shorter than Cajeme 71 (6.30 vs 7.70 cm.). D 10/18/78 as per letter but heads of the variety were the same width. The beaks of DK-22S were very short (4.74 vs 14.4mm. for Cajeme 71, a highly significant difference of 9.7 millimeters.

7

Known by D. M. Atkins

7

ITEM 13 D Exhibit D (continued, page 3) revised.

11. Spike (continued) The awns of DK-22S were 15.38 mm. shorter than Cajeme 71 (44.51 vs 59.9mm.), the difference being highly significant.

12. Glumes: The outer glumes of DK-22S are classed as medium in length and width. (7.71 vs 9.97mm for Cajeme and 3.52 vs 3.90 mm for Cajeme width). The differences were statistically significant but small.

13,14,15 See chart.

16. Seed: The kernels of DK-22S were shorter than Cajeme 71 (6.09 vs 7.03 mm.) but the width was greater (2.97 vs 2.86 mm. for Cajeme 71). The weight per 100 seed was 3.0 grams for DK-22S and 3.25 grams for Cajeme 71. These measures were taken on 10 to several hundred seeds at a time and cannot be statistically analyzed.

Phenol tests of seed by the State Department of Agriculture laboratory were placed in catagory 4 (399 brown to 1 brown-black).

17. See chart.

18. Diseases: The new variety DK-22S has shown high resistance to leaf rust under Texas conditions (Trace infection in 4 station-year observations compared to 38 percent for Cajeme 71).

Quality: Several quality tests of seed of DK-22S have been compared to Cajeme 71 and Penjamo 62 when grown in South Texas. The new variety is rated superior to present commercial varieties for production of commercial bread baking flour.

Reviewed by J. M. Clark

TDA-SI

TEXAS DEPARTMENT OF AGRICULTURE

SEED LABORATORY
REAGAN V BROWN COMMISSIONER
BOX 629
GIDDINGS TX 78942

Test No. 33713

Designated by Sender: Wheat, DK-22S

Phenol Test $3.00

Lot No.

Received: 11-3-77 Test Requested - Complete Germ. Only Purity Only

KIND 283	PURE SEED %	INERT MATTER %	OTHER CROP SEED %	WEED SEED %	GERMINATION %	HARD SEED %	DORMANT SEED %	NOXIOUS WEEDS PER POUND
	PHENOL	TEST						

Date Completed 11-8-77

Submitted By
06696
Douglass W. King Co., Inc.
P. O. Box 20320
San Antonio, Texas 78286

Additional Information
Phenol Test:
399 Brown Seed, 1 Brown-Black Seed

Signed: Kenneth W. Boatwright

KENNETH W. BOATWRIGHT – Seed Analyst

TDA-SI D-12

TEXAS DEPARTMENT OF AGRICULTURE

SEED LABORATORY

Test No. 33712

TDA-SI D-12

TEXAS DEPARTMENT OF AGRICULTURE

Test No.

SEED LABORATORY
REAGAN V BROWN COMMISSIONER
BOX 629
GIDDINGS TX 78942

Designated by Sender: Wheat, Cajeme 71

Phenol Test $3.00

Lot No.

Received: 11-3-77 Test Requested - Complete Germ. Only Purity Only

KIND 283	PURE SEED %	INERT MATTER %	OTHER CROP SEED %	WEED SEED %	GERMINATION %	HARD SEED %	DORMANT SEED %	NOXIOUS WEEDS PER POUND
	PHENOL	TEST						

Date Completed 11-8-77

Submitted By
06696
Douglass W. King Co., Inc.
P. O. Box 20320
San Antonio, Texas 78286

Additional Information
Phenol Test
394 Brown Seed, 6 Brown-Black Seed

Signed: Kenneth W. Boatwright

KENNETH W. BOATWRIGHT – Seed Analyst

QUALITY CHARACTERISTICS OF DK-22S SPRING WHEAT COMPARED WITH APPROPIATE CHECK VARIETIES

The new spring wheat variety, DK-22S, was compared in two seasons and from two locations with appropriate check commercial varieties. The 1976 increase plot grown in South Texas could only be compared with Sturdy, a high quality winter wheat. Data shown in the table indicate that DK-22S was satisfactory in all respects and equal to the variety Sturdy.

Increase fields were grown in the hard red spring wheat growing area of Idaho in 1975 and 1976. In 1975, the variety Cajeme 71, also grown commercially in South Texas, and the variety Borah were used as check varieties. The new variety was equal or superior to the check varieties in every quality characteristic measured.

The 1976 increase seed of DK-22S was compared with the variety Protar, an acceptable commercial variety grown in that area. A sample of Sturdy winter wheat was tested for comparison. The quality characteristics of DK-22S were satisfactory and equal to Protar and Sturdy. It again was classed as a strong gluten wheat.

Tests of three samples, grown under varying conditions, indicate completely satisfactory quality for this new variety. The Lubbock Grain Exchange has graded DK-22S as hard red spring wheat, with the sample submitted having 60 percent dark, hard and vitreous kernsla.

Quality Characteristics Of DK-225 Spring Wheat Compared with Appropriate Check Varieties

Item	1976 Fall South Texas		1975 Spring seeded			1976 Spring Seeded		
	DK-225	Stardy*	DK-225	Cajeme 71 (M 7/10/78)	Borah	DK-225	Pretar	Sturdy*
Moisture %			14.8	14.4	13.3	14.8	13.8	14.5
Protein %	15.5	14.1	13.4	14.7	11.6	15.1	13.1	15.0
Flour protein %	13.4	12.1	11.8	12.8	10.6	13.2	12.0	13.7
Ash %	.46	.52	.45	.48	.50	.54	.57	.48
Absorption %	58.7	57.6	60.6	62.3	61.7	66.5	65.5	66.5
Mixing time	14	14	14	14	13			
Mixing peak	11	8 1/2	10	9 1/2	6		4 1/2	10
Stability	15	15	14	11 1/2	11	11 1/2	8 3/4	
M.T.I.	20	30	20	25	30	25	20	30
Fermentation						Normal	Normal	Normal
Loaf volume			2300	2225	2400	840 Ex.	790 V.G	740 VG
Quality			V. good	Good	Mellow	—		—
Texture			Tri-open	Good	Tri-open	Sl. open	open	open
Oven-Spring			V. mellow	Tri-sticky	Good	—		—
Crust						Smooth	Smooth	Smooth
Crust color			Good	Good	Good			
Valorimeter						69	58	78
Crust rating								96 BC
Comments						Very strong flour	Very strong flour	Very strong flour
Milling yield %						68.1	71.6	68.9
Flour color						95-V-Sl-DC	95-V-Sl-DC	

* Hard red winter variety

Application 7800002